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L3: Entry 4 of 12 File: JPAB Mar 20, 1990

PUB-NO: JP402080372A
DOCUMENT-IDENTIFIER: JP 02080372 A
TITLE: PRODUCTION OF HEAT SINK FOR SEMICONDUCTOR

PUBN-DATE: March 20, 1990

INVENTOR-INFORMATION:
NAME COUNTRY
SHINOZAKI, KAZUO
ANZAI, KAZUO
TAKANO, TAKESHI
TSUGE, AKIHIKO

ASSIGNEE-INFORMATION:
NAME COUNTRY
TOSHIBA CORP

APPL-NO: JP01192514
APPL-DATE: July 27, 1989

INT-CL (IPC): C04B 35/58

ABSTRACT:

PURPOSE: To obtain the high-performance heat sink for semiconductors by molding the heat sink of a raw material formed by adding the oxide or carbonate of Y, La, Pr, Nd, Sm, Gd or Dy to aluminum nitride contg. oxygen and sintering the molding.

CONSTITUTION: The heat sink for semiconductors is produced by using the sintered body of the aluminum nitride obtd. by molding the raw material which consists essentially of the aluminum nitride contg. ≤1wt.% oxygen and is added with 0.01 to 15wt.% ≥1 kinds of the oxides or carbonates of the rare earth elements selected from yttrium, lanthanum, praceodymium, neodymium, samarium, gadolinium, and dysprosium thereto in terms of the rear earth element and sintering the molding. The dense sintered body of the AlN having a high sintering property is not obtainable if the amt. of the oxide or carbonate of the above-mentioned rare earth elements to be added is below 0.01wt.% and the heat resistance and high strength which are the characteristics intrinsic to the sintered body of the AlN are impaired and the high thermal conductivity is degraded if the amt. exceeds 15wt.%.

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L3: Entry 1 of 12 File: JPAB Jun 27, 1995

PUB-NO: JP407165473A
DOCUMENT-IDENTIFIER: JP 07165473 A
TITLE: SEMICONDUCTOR DEVICE

PUBN-DATE: June 27, 1995

INVENTOR-INFORMATION:
NAME COUNTRY
SHINOZAKI, KAZUO
ANZAI, KAZUO
TAKANO, TAKESHI
TSUGE, AKIHIKO

ASSIGNEE-INFORMATION:
NAME COUNTRY
TOSHIBA CORP

APPL-NO: JP06282425
APPL-DATE: October 24, 1994

INT-CL (IPC): C04 B 35/581; H01 L 23/15

ABSTRACT:

PURPOSE: To provide a semiconductor device having excellent heat dissipation by adding a given amount of a rate earth element compound to AlN containing ≤a specific amount of oxygen, forming, firing to give a sintered compact of AlN having a high thermal conductivity and arranging a semiconductor element on the sintered compact of AlN.

CONSTITUTION: (A) A main component comprising aluminum nitride containing ≤1.0wt.% of oxygen is mixed with (B) 0.01-15wt.% calculated as rare earth element of one or more oxides or carbonates (e.g. samarium oxide powder) of a rare earth element selected from yttrium, lanthanum, praseodymium, neodymium, samarium, gadolinium and dysprosium. Then the raw material is formed and sintered to produce a sintered compact of aluminum nitride having a density of ≥90% theoretical density and ≥40W/m.k thermal conductivity at a room temperature. The sintered compact of aluminum nitride is used as a radiating plate and a semiconductor element is arranged on the radiating plate to produce a semiconductor device.